

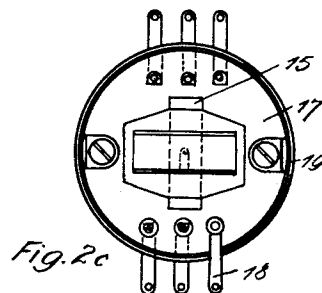
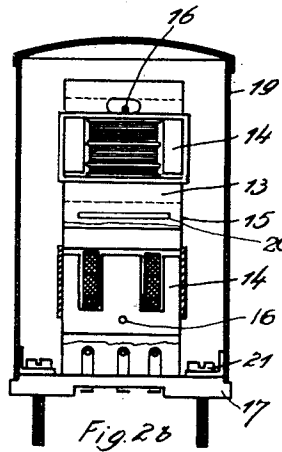
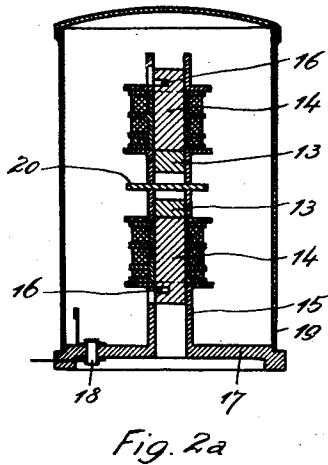
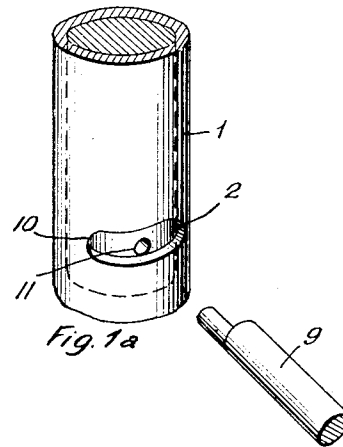
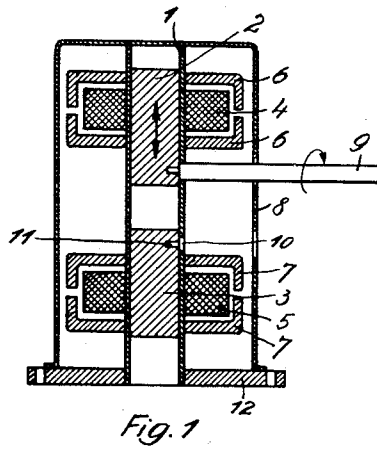
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COIL ARRANGEMENT FOR HIGH FREQUENCY PURPOSES

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COIL ARRANGEMENT FOR HIGH
FREQUENCY PURPOSES

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Continuation of application Serial No. 30,906,
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Serial No. 354,889. In Germany July 14, 1934

6 Claims. (Cl. 171-119)

The high frequency coils with magnetic core that have in recent times been much used, particularly in the wireless receiving set industry, have as a rule previously been made in the following way: the winding was secured to the magnetic core in some way, while the latter was for its part fitted in a special holder. The present innovation makes possible considerable simplification of this manufacturing process, considerable economy both of material and labor being achieved, while the process can be carried out with less waste. In accordance with this new process, an insulating body is used as a holder, which holds not only the winding or windings but also the magnetic core or cores themselves. This arrangement is used in particular with great advantage for the purpose of uniting, in the simplest possible way, several coils and magnetic cores to form one constructional whole, one single insulating holder being used, by means of which holder all the windings and magnetic cores are held.

The insulating holder body possesses a foot-like attachment which serves to secure the whole to the base-plate. This foot-plate serves at the same time as a holder for soldering lugs.

A few examples of execution of this innovation will now be described in detail with the aid of the accompanying drawing, in which:

Fig. 1 is a longitudinal sectional view through a transformer embodying the invention;

Fig. 1a is a fragmentary perspective view, on a larger scale, of the mounting tube and the parts for effecting a trimming adjustment of the inductance of a coil;

Figs. 2a and 2b are longitudinal sectional views, at right angles to each other, through another embodiment of the invention; and

Fig. 2c is a plan view of the same but with the shield can removed.

Fig. 1 shows a very simple form of realization of the innovation. The insulating body serving as a holder consists of a tube 1, preferably round, which, for the purpose of avoiding high frequency losses, is made for preference of insulating materials giving small losses, for example ceramic products of crystalline structure, thermoplastic molding resins of the polystyrol type or molding mixtures of such resins which can be die-cast, or mixtures of polystyrol and quartz, mica, ceramic powders, and the like. Inside this insulating tube 1 are fitted the bar-shaped magnetic cores 2 and 3, which can either be jammed in tight or secured by means of an adhesive. Around the periphery of the insulating tube 1 are

fitted the windings 4 and 5, which are preferably wound so as to be self-supporting, in which case they can simply be pushed on to the tube 1, or else the wire can be wound directly on to the tube 1. According to circumstances, there is also the possibility of closing completely or almost completely the magnetic circuit by means of further magnetic bodies 6 and 7, pushed on to the insulating tube, which magnetic bodies can be made in the shape of plates or bowls. The arrangement offers the advantage that all parts are able to be moved along the axis, so that both the magnetic core in the coil and the magnetic bodies on the outside, or the whole system, can be moved along the insulating tube 1, with the object of altering the self-induction or the coupling factor. Special coupling windings can be added on the tube 1.

In many cases, it is desirable for it to be possible to effect this axial displacement not only by hand, but also by means of an appliance, if possible from outside through a hole in the shield cup 8, which encloses the whole arrangement. Such an operation can be carried out advantageously by means of a very simple device also depicted in Fig. 1 and shown in greater detail in Fig. 1a of the plan. As can be seen, the adjustment is effected by means of a rod 9 which may be inserted in a slot 10 in the insulating tube 1, the rod having a fairly snug fit in the slot and terminating in an eccentrically positioned pin 11 which enters a small hole in the magnetic core 2. Rotation of the rod 9 thus effects an adjustment of the magnetic core longitudinally of the insulating tube 1 and the winding 4 mounted thereon. By turning the pin 9, the magnetic core 2 is moved to-and-fro and very sensitive adjustment is made possible. The same regulating device can be used with small alterations for the purpose of moving to-and-fro the other coil parts.

At the bottom, a base-plate 12, also of insulating material giving small losses, is attached to the insulating tube 1, or else this base-plate can be made in one piece with the insulating tube. This base-plate 12 serves for fastening the whole arrangement on the chassis, for holding the insulating tube and acts as a holder for the soldering lugs and is also used for fastening the shield cup.

Figs. 2a, b and c show a rather different, particularly advantageous arrangement. The cores consist in this case of an E-shaped part 14 and a straight magnet yoke 13. The insulating support 15 is also in the form of a tube, but it is fitted

ted with cavities and projections to enable the insertion of the E-pieces and the yokes and hold them in position. The yokes 13 are secured in the insulating support by means of an adhesive, while the E-pieces 14 are capable of moving axially inside the insulating tube, with the aid of an eccentric device 16, as already described above. The tube parts enclosed by the core 14 are in the form of coil frames and possess several partitions to enable the windings to be fixed in several compartments. This can be seen more clearly in Fig. 2b in which the lower coil is shown in section so that the magnetic core and the coil frame are visible. Here again the base-plate 17 is provided at the bottom, preferably cast at the same time as the support, this base-plate serving to hold and secure the soldering lugs 18 and also to fasten the shield cup 19. The fixing screws 21, with the aid of which the shield cup 19 and the base-plate 17 are secured, extend downwards and serve at the same time for fastening the whole arrangement on the base-board.

The arrangement described above is distinguished by particularly handsome and simple construction with small consumption of material, involving little work and avoiding waste of construction.

Such a coil arrangement is used with advantage as a set of coils for several wave bands, for example, short, medium and long waves, and also as band filters, for example high frequency band filters or medium frequency band filters. By altering the distance between the individual coils or by inserting a metal diaphragm 20 or a magnetic body between the coils, the coupling can be changed.

Instead of making the insulating support in the shape of a tube with co-axially mounted coils, this insulating body can of course (as it can be given without difficulty more complicated shapes during the molding) be formed in such a way that the axes lie parallel to one another or at right-angles to one another in order to attain a less close coupling, or the like.

This application is a continuation of, and filed as a substitute for, my copending application Serial Number 30,906, filed July 11, 1935.

I claim:

1. A coil assembly, comprising a cylindrical

tubular insulating member of thin uniform wall thickness, a plurality of axially spaced cylindrical core pieces tightly fitting the inside of said tubular member, a low capacity multi-layer winding for each core piece, arranged tightly on said tubular member substantially symmetrical to its associated core piece, a core piece extending exteriorly of each of said windings, and means at one end of said tubular member for securing the coil assembly to a support.

2. A coil assembly for use at radio frequencies, said assembly comprising a plurality of low capacity multi-layer coils, magnetic cores substantially completely enclosing the respective coils, and insulating means for supporting said cores and coils in spaced relation, said insulating means having means at one end thereof for securing the coil assembly to a support.

3. A coil assembly as claimed in claim 2, wherein one of said magnetic cores comprises a plurality of relatively adjustable core sections, whereby the self-inductance of the coil within that core may be adjusted.

4. A coil assembly for use at radio frequencies, said assembly comprising a thin-walled tubular member of insulating material, a plurality of low capacity multiple layer coils fitted upon said tubular member and axially spaced from each other, and magnetic cores substantially completely enclosing the respective coils, each of said cores comprising a cylindrical core section tightly fitted into said tubular member and core sections fitted upon the exterior of said tubular member to extend radially along the sides of the respective coils.

5. A coil assembly for use at radio frequencies, said assembly comprising a pair of coils, means supporting said coils in spaced relation, and a magnetic core for each of said coils; said cores each comprising a pair of core sections adjustably mounted on said supporting means substantially completely enclosing the associated coil, and a central core section extending through the associated coil.

6. A coil assembly as claimed in claim 5, in combination with means for adjusting the central core section of each core axially of said pair of core sections of that core.

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